DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference will first be made to Figure 1 in which three cells 2 of a cellular telecommunications network are shown. Each cell 2 is served by a respective base transceiver station (BTS) 4. Each base transceiver station 4 is arranged to transmit signals to and receive signals from the mobile stations 6 located in the cell associated with the given base transceiver station 4. Likewise, each mobile station 6 is able to transmit signals to and receive signals from the respective base transceiver station 4.

The cellular telecommunications network shown in Figure 1 uses a code division multiple access technique. Accordingly, at least some of the mobile stations will be in communication with more than one base station at the same time. This, however, will be described in more detail hereinafter.

The power control method which is used when more than one base station is in communication with more than one mobile station will now be described.

The accuracy of the power control command is based on the quality of power control command received at the mobile station. This is instead of the signal to noise ratio approach which has previously been proposed. The power control command which is transmitted by the base station can have one of two values. If the value of the command is "1", then the base station is instructing the mobile station to increase its transmission power. If the value of the command is "-1", then the base station is instructing the mobile station to decrease its transmission power. In other embodiments of the present invention, the respective values may be "1" and "0" or any other suitable values.

However, due to the effects of interference or the like, the received symbols which are received at the mobile station will have been distorted and can in principle fall in the range of

values from -∞ to +∞. Typical values may fall inside the range -1 to +1 or outside this range. Examples of typical values are +5, .8, or -.4.

The power control command transmitted by the base station is determined by the base station from the strength of signals received from the mobile station. Based on the strength of the received signals, the base station determines if the mobile station should increase or decrease its transmission power. The power control command values can alternatively be determined in any suitable manner.

Reference is made to Figure 2 which shows how a decision is made as the which of the two commands the mobile station has received. A threshold value T is defined. If the value detected at the mobile station is above the threshold T, then the value is determined to be +1. If the value detected by the mobile station is below the threshold T, the value is determined to be -1. As can be seen from Figure 2, the threshold T may not be centrally located at 0 between the extreme values at each end of the range. In preferred embodiments, the threshold is between the values of -.6 to 0. More preferably, the threshold is between the values of -0.25 to -0.03. These values are appropriate in situations where the noise has normalised. It should be appreciated that the normalisation can be carried out in any appropriate way. The values given by way of example for the threshold will be dependent on the nature of the system including the method of normalisation and therefore can be different to those suggested hereinbefore.

This decision can be summarised as follows:
If the value of the power control command received at the mobile station is greater than or equal to the threshold value (marked A in Figure 2) then the power control command is +1.
In other cases (marked B in Figure 2) the the power control command is -1.

If a mobile station is in communication with two or more base stations, the mobile station will receive a power control value from each base station. The power control value from each base station is determined as described hereinbefore. The power command signal from each of the base stations are compared and the minimum power control command value is selected. In other words, if at least one base station instructs the mobile station to decrease its power, then the mobile station will decrease its power.

The threshold can be set so that the decrease power command is generally more accurate than the increase power command. This is because if a mobile station is interprets incorrectly the power control command and reduces the power instead of increasing it, then the connection between the mobile station and the base station could be lost or adversely affected. This could be a problem particularly if successive increase power control commands are misinterpreted as decrease power control commands. Additionally since one decrease power control instruction from one of a plurality of base stations is enough to cause the mobile station to decrease power, it is more likely that the power will be decreased in practice than increased, thus effectively compensating for the threshold being closer to the decrease power value than the increase power value. In alternative embodiments of the present invention, the threshold can be set so that the increase power control command is more accurate than the decrease power command.

This method of determining the power control value may be used by mobile stations which are only in communication with a single base station as well as by mobile stations in communication with a plurality of base stations.

Reference is now made to Figure 3 which illustrates a second embodiment of the present invention. The block diagram of Figure 3 illustrates figuratively elements present in a mobile station embodying the present invention. Each of the power control